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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
10/516,627	11/07/2005	Dirk Marsitzky	13077*114 (LeA 35,985)	6971
23416 7590 08/05/2009 CONNOLLY BOVE LODGE & HUTZ, LLP P O BOX 2207 WILMINGTON, DE 19899			EXAMINER YAMNITZKY, MARIE ROSE	
			ART UNIT 1794	PAPER NUMBER
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Please find below and/or attached an Office communication concerning this application or proceeding.

The time period for reply, if any, is set in the attached communication.

Office Action Summary	Application No. 10/516,627	Applicant(s) MARSITZKY ET AL.	
	Examiner Marie R. Yamnitzky	Art Unit 1794	

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) OR THIRTY (30) DAYS, WHICHEVER IS LONGER, FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

- 1) ☒ Responsive to communication(s) filed on 16 April 2009.
- 2a) ☐ This action is **FINAL**. 2b) ☒ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

- 4) ☒ Claim(s) 1-29 is/are pending in the application.
- 4a) Of the above claim(s) 24-26 and 29 is/are withdrawn from consideration.
- 5) ☐ Claim(s) _____ is/are allowed.
- 6) ☒ Claim(s) 1-23, 27 and 28 is/are rejected.
- 7) ☐ Claim(s) _____ is/are objected to.
- 8) ☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

- 9) ☐ The specification is objected to by the Examiner.
- 10) ☐ The drawing(s) filed on _____ is/are: a) ☐ accepted or b) ☐ objected to by the Examiner.
Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).
Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).
- 11) ☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

- 12) ☒ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☒ All b) ☐ Some * c) ☐ None of:
1. ☐ Certified copies of the priority documents have been received.
 2. ☐ Certified copies of the priority documents have been received in Application No. _____.
 3. ☒ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

* See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

- | | |
|--|---|
| 1) <input checked="" type="checkbox"/> Notice of References Cited (PTO-892) | 4) <input type="checkbox"/> Interview Summary (PTO-413) |
| 2) <input type="checkbox"/> Notice of Draftsperson's Patent Drawing Review (PTO-948) | Paper No(s)/Mail Date. _____ |
| 3) <input checked="" type="checkbox"/> Information Disclosure Statement(s) (PTO/SB/08) | 5) <input type="checkbox"/> Notice of Informal Patent Application |
| Paper No(s)/Mail Date <u>See Continuation Sheet</u> . | 6) <input type="checkbox"/> Other: _____ |

Continuation of Attachment(s) 3). Information Disclosure Statement(s) (PTO/SB/08), Paper No(s)/Mail Date :
06 Jan 2006, 24 Apr 2009, 09 Jul 2009.

1. Applicant's election with traverse of Group I (claims 1-23, 27 and 28) in the reply filed on April 16, 2009 is acknowledged. The traversal is on the ground(s) that simultaneous examination of Groups I-IV would present no undue search burden on the examiner. This is not found persuasive because the different groups require different fields of search and are not so linked as to form a single general inventive concept under PCT Rule 13.1.

The requirement is still deemed proper and is therefore made FINAL.

2. Applicant's election of the species as set forth in the reply filed on April 16, 2009 is acknowledged. The election of species is said to be "with traverse", but because applicant did not distinctly and specifically point out the supposed errors in the election of species requirement, the election has been treated as an election without traverse (MPEP § 818.03(a)).

On July 23, 2009, the examiner telephonically spoke with Eamonn Morrison and requested clarification of the elected species. General formula C has L^1 and L^2 , rather than "L". The examiner questioned whether applicant had elected a species in which L^1 and L^2 of formula C are the same, or whether applicant had elected the species of Example 8, in which L^1 and L^2 are not the same. The examiner also noted that while applicant referred to Example 8 as showing L as 4-fluorenyl-2-pyridine, Example 8 shows "4-fluorophenyl-2-pyridine" rather than 4-fluorenyl-2-pyridine. Based on the July 23rd phone conversations with Eamonn Morrison, the elected species is a polymer having a structure of general formula C wherein Ar^1 is a 9,9'-dialkylfluorenyl residue, M is iridium (III) and L^1 and L^2 are 4-fluorophenyl-2-pyridine ligands.

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This election corresponds to Ar¹ as formula XXXIV as shown, e.g., in claims 4 and 9, and L¹ and L² as formula I as shown, e.g., in claims 2 and 7.

Applicant identifies claims 1-23, 27 and 28 as reading on the elected species. The examiner notes that there is insufficient information of record to confirm that claim 11 and dependents read on the elected species given the properties required for these claims. While it appears that some polymers having a structure of general formula C may possess the properties recited in claim 11 and dependents, it is not clear that all polymers having a structure of general formula C possess the recited properties, and it is not clear whether a polymer having the formula C structure wherein Ar¹ is a 9,9'-dialkylfluorenyl residue, M is iridium (III) and L¹ and L² are 4-fluorophenyl-2-pyridine ligands possesses the recited properties. However, for purposes of this action, claim 11 and dependents will be included as reading on the elected species.

3. Claims 24-26 and 29 are withdrawn from further consideration pursuant to 37 CFR 1.142(b), as being drawn to a nonelected invention, there being no allowable generic or linking claim. Applicant timely traversed the restriction requirement between Groups I-IV in the reply filed on April 16, 2009.

Withdrawn claims 24-26 are process claims. Withdrawn claim 29 is a “use” claim that is not a proper method claim under 35 U.S.C. 101 and/or 112, 2nd paragraph, but could potentially be amended to be a proper method (process) claim. Note the comments set forth beginning on page 7 of the restriction/lack of unity requirement mailed January 15, 2009 regarding rejoinder of withdrawn process claims upon allowance of a product claim. If the withdrawn claims are

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amended with a view toward possible rejoinder, applicant should make sure that the claims are in proper form (e.g. with respect to proper dependent claim form, and with correction of the “use” claim).

4. With respect to the Information Disclosure Statement filed January 06, 2006, the four foreign patent documents and the three non-patent literature documents that have been lined through have not been considered by the examiner and are not made of record because no copies of these cited documents were provided. The PTO 1449 indicated that copies of these seven documents were previously submitted by WIPO. While a search report listing these documents was received, the documents themselves were not. Applicant is advised that the date of submission of any item of information or any missing element(s) will be the date of submission for purposes of determining compliance with the requirements based on the time of filing the IDS, including all “statement” requirements of 37 CFR 1.97(e). See MPEP § 609.05(a).

5. Claims 3-6, 8-10, 14-23, 27 and 28 are objected to under 37 CFR 1.75(c) as being in improper form because a multiple dependent claim should refer to other claims in the alternative only, and cannot depend from any other multiple dependent claim. See MPEP § 608.01(n). For purposes of this Office action, the examiner has treated the improper multiple dependent claims as if each claim that refers to more than one claim referred only to the first claim recited. (For example, claims 3-6, 8-10 and 27 have been treated as if dependent solely from claim 1.)

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6. Claims 11-23 are rejected under 35 U.S.C. 112, first paragraph, because the specification, while being enabling for luminescent polymers having a conjugated main chain and containing at least one covalently bonded metal complex, does not reasonably provide enablement for the full scope of such polymers as further defined by the requirement that the luminescence be a combination of fluorescence of the conjugated main chain and phosphorescence of the covalently bonded metal complex(es) and/or as further defined by the emission characteristics recited in claims 12 and 13. The specification does not enable any person skilled in the art to which it pertains, or with which it is most nearly connected, to make the invention commensurate in scope with these claims.

The specification provides numerous examples of units that may be used to form a conjugated main chain of a polymer, numerous examples of ligands that may be used to form a covalently bonded metal complex, various metals that may be used for the metal complex, and several different overall polymer structures. The various possibilities for the different components of the polymer, and the different overall polymer structures, encompass thousands of different polymers that can be made within the general requirements of a conjugated main chain and at least one covalently bonded metal complex.

Insufficient guidance is provided in the specification to enable one of ordinary skill in the art at the time of the invention to make and use the full scope of polymers within the scope of claim 11 and dependents wherein the polymers are required to have the properties recited in these claims. The specification provides a few examples of polymers that emit white light and have CIE coordinates as set forth in claim 13. It is not clear from the disclosure whether those

particular polymers exhibit luminescence that is a combination of fluorescence and phosphorescence as required by claim 11. Presuming for the sake of argument that the white light emitting polymers of the examples which provide CIE coordinates within the scope of those recited in claim 13 inherently exhibit of combination of fluorescence and phosphorescence per claim 11, those few examples are insufficient to enable one of ordinary skill in the art at the time of the invention to make and use the full scope of the claimed invention as defined by the recited properties. The few examples do not able one of ordinary skill to be able to determine, without undue experimentation, which of the myriad of possible conjugated units, ligands and metals can be combined in various polymeric structures to make polymers having the recited properties.

7. Claims 3-6, 8-23, 27 and 28 are rejected under 35 U.S.C. 112, second paragraph, as being indefinite for failing to particularly point out and distinctly claim the subject matter which applicant regards as the invention.

The variables L^1 and L^2 are not defined in claim 3 as dependent from claim 1.

Claim 3 limits "M" to four metals, one of which is gallium (II). The definition of M as gallium (II) appears to be inconsistent with the requirement for a phosphorescent metal complex and phosphorescent polymer.

A broad range or limitation together with a narrow range or limitation that falls within the broad range or limitation (in the same claim) is considered indefinite, since the resulting claim does not clearly set forth the metes and bounds of the patent protection desired. See MPEP § 2173.05(c). Note the explanation given by the Board of Patent Appeals and Interferences in *Ex*

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parte Wu, 10 USPQ2d 2031, 2033 (Bd. Pat. App. & Inter. 1989), as to where broad language is followed by “such as” and then narrow language. The Board stated that this can render a claim indefinite by raising a question or doubt as to whether the feature introduced by such language is (a) merely exemplary of the remainder of the claim, and therefore not required, or (b) a required feature of the claims. Note also, for example, the decisions of *Ex parte Steigewald*, 131 USPQ 74 (Bd. App. 1961); *Ex parte Hall*, 83 USPQ 38 (Bd. App. 1948); and *Ex parte Hasche*, 86 USPQ 481 (Bd. App. 1949). In the present instance, claim 3 recites the broad recitation “Sp is a spacer”, and the claim also recites “in particular a linear or branched...or a C₁-C₁₂-alkylenedicarboxamide unit”, which is the narrower statement of the range/limitation. It is not clear if “Sp” may be any spacer unit, or only those recited after “in particular”.

There is no antecedent basis for general formulae A, B-Ia, B-II, C or D as recited in claim 4 as dependent from claim 1.

There is no antecedent basis for general formulae A, B-Ia, B-II, C or D as recited in claim 5 as dependent from claim 1, or for Ar¹, Ar², Ar³, L¹, L², M, n, z or Sp as dependent from claim 1. The R variables in the formulae shown in claim 5 are also not properly defined in claim 5 as dependent from claim 1.

Claim 5 refers to formula XXIV in the definition of L¹ and L². There is no formula labeled as “XXIV”, but there is a formula with no label after the formula labeled as “XXI”.

The limitations of claim 6 are not clear in reciting “repeating units selected from...formulae A and B-I-1 to B-I-5 or A and B-II-1 and B-II-4 or has a structure of...formulae

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C-1 and C-2” (emphasis added). It is not clear which formulae must be contained in the polymer in combination and which are alternatives to each other.

Formulae B-II-1 and B-II-4 as shown in claim 6 are the same.

Formula B-II-2 in claim 6 provides a repeating unit in which the metal complex is a gallium complex, but the claim is limited to a phosphorescent conjugated polymer. It is not clear how the gallium complex unit of formula B-II-2 can provide a phosphorescent polymer. It is not clear if the B-II-2 structure must be used in combination with one of the structures comprising Ir or Pt.

In claim 6, the spacing of the lines with respect to the formulae for Ar^1 , Ar^2 and L is confusing. The claim should be rewritten so that it is clear which formulae define each variable.

Claim 6 defines R^3 , but this variable is not in the formulae set forth in claim 6, and is not in claim 1.

In claim 6, the use of “and” in the definitions of R^2 - R^5 appears to require each of these R variables to represent two distinct possibilities at the same time, which is not possible.

The variable “n” is not properly defined in claim 6 as dependent from claim 1.

Claim 8 is indefinite because L^1 and L^2 are not properly defined as dependent from claim 1, because the definition of M as gallium (III) appears to be inconsistent with the requirement for a phosphorescent complex and polymer, and because the definition of Sp includes a broad range or limitation together with a narrow range or limitation that falls within the broad range or limitation.

Claim 9 is indefinite because there is no antecedent basis for the various general formulae and the Ar variables as dependent from claim 1.

Formulae B-II-1 and B-II-4 as shown in claim 10 are the same.

Formula B-II-2 in claim 10 provides a repeating unit in which the metal complex is a gallium complex, but the claim is limited to a phosphorescent conjugated polymer. It is not clear how the gallium complex unit of formula B-II-2 can provide a phosphorescent polymer. It is not clear if the B-II-2 structure must be used in combination with one of the structures comprising Ir or Pt.

In claim 10, the use of “and” in the definitions of R^2 - R^5 appears to require each of these R variables to represent two distinct possibilities at the same time, which is not possible.

The variable “n” is not properly defined in claim 10 as dependent from claim 1.

Proper antecedent basis is lacking for “the fluorescence” and for “the phosphorescence” as recited in line 3 of claim 11, with claims 12-23 dependent directly or indirectly therefrom.

The variables n, Ar^1 , Ar^2 and L^2 are not defined in claim 16 as dependent from claim 14.

The variables n, Ar^1 , Ar^2 and L^2 are not defined in claim 17 as dependent from claim 14.

If claim 18 properly further defines claim 11, it is not clear what other bonding arrangements are encompassed by claim 11. Claim 11 requires a conjugated main chain and a covalently bonded metal complex. It is not clear how the metal complex of claim 11 could be covalently bonded, other than to the conjugated main chain.

Claim 20 depends from claim 19 and refers to claim 18 for the definition of n, Ar^1 and L^2 ; these variables are defined in claim 19.

Claim 23 includes a broad range for “n” together with a narrow range that falls within the broad range, together with an even narrower range. It is not clear what “n” is limited to per claim 23.

Proper antecedent basis is lacking for “luminescent polymer” as recited in claim 27 as dependent from claim 1.

8. The following is a quotation of the appropriate paragraphs of 35 U.S.C. 102 that form the basis for the rejections under this section made in this Office action:

A person shall be entitled to a patent unless –

(b) the invention was patented or described in a printed publication in this or a foreign country or in public use or on sale in this country, more than one year prior to the date of application for patent in the United States.

(e) the invention was described in (1) an application for patent, published under section 122(b), by another filed in the United States before the invention by the applicant for patent or (2) a patent granted on an application for patent by another filed in the United States before the invention by the applicant for patent, except that an international application filed under the treaty defined in section 351(a) shall have the effects for purposes of this subsection of an application filed in the United States only if the international application designated the United States and was published under Article 21(2) of such treaty in the English language.

9. Claims 1-10, 27 and 28 are rejected under 35 U.S.C. 102(b) as being anticipated by Doi et al. (US 2002/0027263 A1).

See paragraphs [0113]-[0114] and [0200]-[0214]. Doi’s polymeric substances 7, 8 and 9 are conjugated, neutral and contain a covalently bonded derivative of tris(2-phenylpyridine) iridium (III), which is a phosphorescent metal complex. Although Doi et al. refer to the polymers as fluorescent rather than phosphorescent, it is the examiner’s position that it is reasonable to expect that the polymer exhibits phosphorescence due to the presence of the iridium complex in the polymer. Doi’s polymeric substances meet the limitations of a polymer

according to present claims 1-10. For example, Doi's polymeric substances 7, 8 and 9 each comprise a metal complex of Ir(III) that is chelated to three L ligands represented by formula I as shown in claims 2, 5 and 7, comprise a repeating unit of formula XXXIV as shown in claims 4 and 9 and, based on the description of the reactants, include repeating units of the general formula A and B-Ia of claim 3, A and B-I-2 of claims 6 and 10, and A, B-Ia and B-Ib of claim 8. Doi teaches that the polymers may be used as light emitting materials in a polymer LED, which is within the scope of the electroluminescent arrangement of present claims 27 and 28.

10. Claims 1-10, 27 and 28 are rejected under 35 U.S.C. 102(e) as being anticipated by Ikehira et al. (US 2002/0193532 A1).

See the entire patent application publication. Ikehira et al. describe polymers that are conjugated, neutral and contain at least one covalently bonded metal complex that shows light emission from a triplet excited state (i.e. is a phosphorescent metal complex).

Polymers comprising any of the repeating units shown in paragraph [0044] meet the limitations of a polymer according to present claim 1, with some further meeting the limitations of one or more dependent claims. The polymers of Ikehira's Examples 3-5 are polymers within the scope of present claims 1-10. For example, Ikehira's polymers of Examples 3-5 each comprise a metal complex of Ir(III) that is chelated to three L ligands represented by formula I as shown in claims 2, 5 and 7, comprise a repeating unit of formula XXXIV as shown in claims 4 and 9 and, based on the description of the reactants, include repeating units of the general formula A and B-Ia of claim 3, A and B-I-2 of claims 6 and 10, and A, B-Ia and B-Ib of claim 8.

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Ikehira's polymer LED of Example 6 meets the limitations of an electroluminescent arrangement per present claims 27 and 28.

11. The present claims are too broad and too unclear for the examiner to be able to examine the full scope of the claims (and in the case of claim 11 and dependents, not fully enabled).

However, it appears that phosphorescent polymers represented by any of formulae C-1, C-2, C-3, D-1, D-2 and D-3 are not disclosed or suggested by the prior art.

12. Any inquiry concerning this communication should be directed to Marie R. Yamnitzky at telephone number (571) 272-1531. The examiner works a flexible schedule but can generally be reached at this number from 7:00 a.m. to 3:30 p.m. Monday and Wednesday-Friday.

The current fax number for all official faxes is (571) 273-8300. (Unofficial faxes to be sent directly to examiner Yamnitzky can be sent to (571) 273-1531.)

/Marie R. Yamnitzky/
Primary Examiner, Art Unit 1794

MRY
August 03, 2009